



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2017-0719; Product Identifier 2017-NE-22-AD; Amendment 39-19163; AD 2018-02-10]**

**RIN 2120-AA64**

**Airworthiness Directives; Pratt & Whitney Division Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** We are adopting a new airworthiness directive (AD) for all Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engines. This AD was prompted by the discovery of multiple cracked outer diffuser cases. This AD requires initial and repetitive inspections to detect cracks in the outer diffuser case and removal from service of cases that fail inspection. We are issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** For service information identified in this final rule, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06118; phone: 800-565-0140; fax: 860-565-5442. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7759. It is also available on the

internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0719.

### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0719; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for Docket Operations (phone: 800-647-5527) is Document Operations, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

**FOR FURTHER INFORMATION CONTACT:** Jo-Ann Theriault, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7105; fax: 781-238-7199; email: [jo-ann.theriault@faa.gov](mailto:jo-ann.theriault@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to PW PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engines. The NPRM published in the Federal Register on August 25, 2017 (82 FR 40514). The NPRM was prompted by the discovery of multiple cracked outer diffuser cases. The NPRM proposed to require initial and repetitive inspections to detect cracks in the outer diffuser case and removal from service of cases that fail inspection. We are issuing this AD to correct the unsafe condition on these products.

## **Comments**

We gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

### **Request to Change Compliance**

PW requested that we change the effective date of the 1,000 cycle drawdown to "within 1,000 flight cycles from March 31, 2017", to coincide with PW Alert Service Bulletin (ASB) PW4G-112-A72-347, rather than "within 1,000 flight cycles from the effective date of this AD". PW stated that making the 1,000 cycle drawdown effective March 31, 2017, rather than the effective date of this AD, maintains the same level of risk.

We disagree with changing the effective date of the 1,000 cycle drawdown to "within 1,000 flight cycles from March 31, 2017", to coincide with PW ASB PW4G-112-A72-347 because we cannot force mandatory action based on dates in the past. Mandatory action must be based on the effective date of this AD. In addition, we determined that basing the initial inspection and the inspection interval on the effective date of this AD maintains an acceptable level of safety. We did not change this AD.

### **Request to Add Credit for Previous Actions**

PW and United Airlines (UAL) requested that we add Credit for Previous Actions to allow operators to take credit for inspections performed per PW ASB PW4G-112-A72-347, dated March 31, 2017 prior to the effective date of this AD.

We disagree. Since use of PW ASB PW4G-112-A72-347, dated March 31, 2017, is required in the compliance section of this AD, we do not need to reference this SB in the Credit for Previous Actions paragraph. Inspections performed per PW ASB PW4G-112-A72-347 prior to the effective date of this AD meet the criteria of "unless already done" in the compliance section of this AD.

**Request to Change Definitions**

UAL requested that we define “engine disassembly” as “when the M flange is split”. UAL reasoned that this would clarify the compliance requirements for operators and is consistent with PW ASB PW4G-112-A72-347, dated March 31, 2017.

We agree. Defining “engine disassembly” clarifies compliance requirements for operators. We added a Definition paragraph to this AD.

**Request to Change Compliance Time**

UAL requested that we add a third option for the initial inspection so that it could be performed prior to accumulating 13,000 cycles since new, or within 1,000 cycles from the effective date of this AD, or within 2,000 cycles since the last outer diffuser case piece-part fluorescent penetration inspection (FPI), whichever occurs later.

We partially agree. We agree with giving operator’s credit for inspections done at piece-part exposure because if the outer diffuser case was inspected at piece-part exposure and passed inspection, it meets the initial inspection requirement mandated by this AD. We added a “Credit for Previous Actions” paragraph to this AD. Therefore, we disagree with adding the third option to the initial inspection compliance time specified in paragraph (g)(1) of this AD.

**Request to Change Compliance**

UAL requested that we identify the outer diffuser case piece-part level FPI done in accordance with PW Cleaning, Inspection and Repair (CIR) Manual 72-41-13, Inspection/Check-02, as an acceptable means of compliance for the repetitive inspections. UAL reasoned that when the outer diffuser case is at piece-part level, PW CIR Manual 72-41-13, Inspection/Check-02, is performed. The piece-part level FPI is equivalent to the high sensitivity module level inspection provided in PW ASB PW4G-112-A72-347, dated March 31, 2017.

We agree. Inspections performed at piece-part exposure maintain an acceptable level of safety because the piece-part level FPI specified in PW CIR Manual Part Number 51A750, section 72-41-13, Inspection/Check-02 is equivalent to the inspection mandated by this AD. Since we did not incorporate by reference a particular FPI process specification, a high sensitivity FPI using the methods, techniques, and practices equivalent to the current manufacturer's maintenance manual or Instructions for Continued Airworthiness satisfy both the initial and repetitive requirements of this AD. We did not change this AD.

### **Request to Change Service Information**

PW requested that we change the service information reference from PW ASB PW4G-112-A72-347, dated March 31, 2017, to PW ASB PW4G-112-A72-347, Revision No. 1, dated October 26, 2017. PW stated that the SB has been revised to provide inspection clarifications requested by operators.

We disagree. We did not include PW ASB PW4G-112-A72-347, Revision No. 1, dated October 26, 2017, since the risk analysis was based on the original ASB and we did not have the opportunity to give the public a chance to comment on this revision. We did not change this AD.

### **Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

#### **Related Service Information under 1 CFR part 51**

We reviewed PW ASB PW4G-112-A72-347, dated March 31, 2017. This PW ASB provides guidance on performing outer diffuser case FPIs. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

#### **Other Related Service Information**

We reviewed PW4000 Series (112 Inch) Engine CIR Manual, Part Number 51A750, Revision Number 74, section 72-41-13, Inspection/Check-02, dated July 15, 2017. This manual section provides guidance on performing a high sensitivity FPI of the outer diffuser case at piece-part exposure.

#### **Costs of Compliance**

We estimate that this AD affects 121 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

<b>Estimated costs</b>				
Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Tt3 boss inspection	3.5 work-hours X \$85 per hour = \$297.50	\$0	\$297.50	\$35,997.50

We estimate the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. We estimate six cases will need to be replaced in the domestic fleet.

### On-condition costs

Action	Labor cost	Parts cost	Cost per product
FPI Inspection of outer diffuser case	10 work-hours X \$85 per hour = \$850	\$0	\$850
Replacement of outer diffuser case	\$0	\$750,000	\$750,000

### Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

## **Regulatory Findings**

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **Adoption of the Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

2018-02-10 **Pratt & Whitney Division**: Amendment 39-19163; Docket No. FAA-2017-0719; Product Identifier 2017-NE-22-AD.



**(a) Effective Date**

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to all Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engines with outer diffuser case, part number (P/N) 50J775 or P/N 50J930, installed.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7240, Turbine Engine Combustion Section.

**(e) Unsafe Condition**

This AD was prompted by the discovery of multiple cracked outer diffuser cases. We are issuing this AD to prevent failure of the outer diffuser case. The unsafe condition, if not corrected, could result in failure of the outer diffuser case, uncontained case release, damage to the engine, and damage to the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) Perform an initial high sensitivity fluorescent penetrant inspection (FPI) of the outer diffuser case T3 thermocouple probe boss (Tt3 boss) prior to accumulating 13,000 cycles since new (CSN), or within 1,000 flight cycles from the effective date of this AD, whichever occurs later. If the case CSN is unknown, inspect within 1,000 flight cycles from the effective date of this AD.

(2) Thereafter, repeat the high sensitivity FPI of the outer diffuser case Tt3 boss within 2,000 flight cycles since the last FPI.

(3) If an indication is found during the inspections required by paragraphs (g)(1) or (2) of this AD, re-inspect or remove the outer diffuser case from service as follows:

(i) For engines installed on-wing, re-inspect or remove in accordance with the Accomplishment Instructions, Part A, paragraph 1.G., of PW ASB PW4G-112-A72-347, dated March 31, 2017.

(ii) For assembled engines not installed on-wing, re-inspect or remove in accordance with the Accomplishment Instructions, Part B, paragraph 1.C., of PW ASB PW4G-112-A72-347, dated March 31, 2017.

(iii) For disassembled engines, if any cracks are found, remove the outer diffuser case from service before further flight.

(4) Within 30 days of the effective date of this AD, update the mandatory inspections of the Airworthiness Limitations Section (ALS) of your Instructions for Continued Airworthiness to include the piece-part inspections of the diffuser case as defined in Figure 1 to paragraph (g) of this AD.

**Figure 1 to Paragraph (g) – Addition to ALS**

<b>Description</b>	<b>Part Number</b>	<b>Cleaning, Inspection and Repair (CIR) Manual Section</b>	<b>CIR Manual Inspection</b>	<b>CIR Manual</b>
Case, Diffuser, Outer	All	72-41-13	Inspection/Check (I/C-02)	P/N 51A750

**(h) Credit for Previous Actions**

You may take credit for the high sensitivity FPI of the outer diffuser case Tt3 boss that is required by paragraph (g)(1) of this AD if you performed a high sensitivity FPI of the outer diffuser case at piece-part exposure before the effective date of this AD, using

PW4000 Series (112 Inch) Engine CIR Manual, P/N 51A750, section 72-41-13, Inspection/Check-02, dated July 15, 2017.

**(i) Definition**

For the purpose of this AD, an engine is considered disassembled any time the “M” flange is separated.

**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ECO Branch, send it to the attention of the person identified in paragraph (k)(1) of this AD. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(k) Related Information**

(1) For more information about this AD, contact Jo-Ann Theriault, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7105; fax: 781-238-7199; email: jo-ann.theriault@faa.gov.

(2) PW4000 Series (112 Inch) Engine CIR Manual, Part Number 51A750, Revision Number 74, section 72-41-13, Inspection/Check-02, dated July 15, 2017, which is not incorporated by reference in this AD, can be obtained from PW, using the contact information in paragraph (l)(3) of this AD.

**(I) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Pratt & Whitney (PW) Alert Service Bulletin PW4G-112-A72-347, dated March 31, 2017.

(ii) Reserved.

(3) For PW service information identified in this AD, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06118; phone: 800-565-0140; fax: 860-565-5442.

(4) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7759.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:  
<http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on January 12, 2018.

Robert J. Ganley,  
Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.

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